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ABSTRACT

This paper describes what in the area of assessment is essential knowledge for a prospective teacher. The listings of topics which would be relevant for a course in measurement for preservice teachers are presented as they might appear in a course syllabus. For each topic, the rationnale for its inclusion is given, as well as the skills which would be developed and the specific subjects the topic would include. The eight content areas are: (1) basic concepts and terminology of assessment; (2) uses of assessment; (3) assessment planning and development; (4) interpretation of assessments; (5) description of assessment results; (6) evaluation and improvement of assessments; (7) feedback and grading; and (8) ethics of assessment. (JD)

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Assessment Essentials in Professional Education of Teachers

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Only about half of the teacher education programs in the nation currently require a course in measurement for initial certification (Schafer and Lissitz, 1987). This statement could have been made at any time over the past thirty years (Roeder, 1972, 1973; Noll, 1955). However, when such a course is included in a student's program, it often does not include what is important for teachers to know, as judged by teachers, themselves (Gullickson, 1986), and its content is not what teachers who have taken it commonly use in practice (Stiggins, 1987).

While the reasons for deficiencies in measurement education for many teachers are unclear, perhaps to be included among them are (1) ineffective communication of the importance of assessment concepts and methods for effective teaching and (2) lack of a clear expression on the part of the measurement community about what should be included in that training.

The purpose of this paper is to attempt to describe what in the area of assessment is essential knowledge for a teacher, to do so in a way which can be communicated to the broad educational community, to provide a justification for each area of content, and to give an expansion for each in terms of topics that might be included in instruction. The importance of including each area is developed in a rationale which draws upon various sources, including formal statements by professional associations, positions of teacher associations or their representatives, and relevant literature about the needs and activities of teachers.

The listings of topics which would be relevant for instruction in each content area are presented as they might appear in a highly specific course syllabus. These are drawn from textbooks in measurement as well as published literature. While the content areas and the skills are intended eventually to be prescriptive, the lists of topics are not. Indeed, they are probably at once incomplete and too numerous for a single course. They are intended both to serve as amplifications of the content areas and to be used as a source of suggestions for measurement instructors as they define their own courses in educational measurement.

This effort is intended to be part of a process by which the measurement community can define that body of content which all teachers should have a command over. For example, an eventual result of such work might be a formal statement by NCME about the specifics of teacher education in measurement.

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The eight content areas and their amplifications follow:

CONTENT: Basic Concepts and Terminology of Assessment

SKILLS: Explain the purposes and techniques of assessment and criteria for their success; use the language of measurement precisely

RATIONALE: Assessing, grading, and evaluating students has been identified as one of a teacher's six core job functions (Rosenfeld, Thornton, and Skurnik, 1986) and it has been found that teachers can spend up to one-third of their instructional time on assessment-related activities (Stiggins, 1987). Indeed, Smith, Silverman, and Borg (1980) and Gulliksen (1986) argue that all teachers need assessment skills to be effective. Recognition of the importance of measurement skills for teachers is indicated by the National Education Association's position that teachers need to test (NEA, 1983), Shanker's (1985) position that a teacher's ability to assess pupil performance is critical to success, and the inclusion of diagnosis as one of the five skill components on the National Teacher Examination (Hufker, 1982). An understanding of the concepts and language of measurement is a prerequisite for effective study of the techniques of assessment. It is particularly important that teacher education programs include this content because measurement expertise is not, in general, available to teachers in the field from any other source (Stiggins, 1987).

TOPICS: definitions of assessments, tests, performances, products, projects, observations, interviews, and evaluations
methods of assessment (e.g., teacher-made, paper-and-pencil tests; text-embedded, paper-and-pencil tests; performance assessments; oral questions; homework and seatwork assignments; standardized tests; opinions of others; group assessments)
formative and summative assessment
norm-referenced and criterion-referenced assessment
objectives and domains of objectives
accountability and minimum competency testing programs
reliability, validity, and objectivity

CONTENT: Uses of Assessment

SKILLS: Identify the ways in which measurements are used by teachers and other educators; relate information needs for assessments to their goals

RATIONALE: Tests and other measurement methods are being used to meet a broad variety of needs (Newman and Stallings, 1982; Stiggins, Conklin, Bridgeford, Green, and Brody, 1987). The contexts in

which assessments take place should be understood because the purpose of an assessment should be a determiner of both the activities used and evaluations of their success.

TOPICS: goals of assessment:
- diagnosis of individual student needs
- diagnosis of group needs
- determining interests
- monitoring progress toward goals
- assignment of grades
- formation of instructional groups within a class
- identification of students for special services
- motivation of students
- evaluation of instructional effectiveness
- evaluation of institutional effectiveness
- communication of achievement expectations
- communication of behavioral expectations
- provision of test-taking experience
- accountability for student learning
- assessment as an instructional strategy
- prediction of success in a program
- certificaton of competency

information criteria:
- amount of information
- specificity of information
- degree of reliability
- extent of validity
- degree of interpretability
- protection for consequences of error
- availability for decision making
- practicality of use

CONTENT: Assessment Planning and Development

SKILLS: Define and sample content domains for measurement; describe the range of sources of quantitative and qualitative data; apply decision criteria to select appropriate assessment forms; explain how assessment tools are best developed or located, selected, and administered

RATIONALE: Test use includes making decisions about what to test and which sorts of tests to use, but more than half the tests used by a majority of teachers are constructed by the teachers, themselves (Newman and Stallings, 1982). The processes involved include domain specification, content sampling, writing of probes, test assembly, administration, and scoring. In order to be effective in these assessment roles, the teacher should be aware of goals for each process, and be able to select and apply techniques designed to meet them. The current National Council for Accreditation of Teacher Education

standards reflects the importance of this content by including "design and use of evaluation and measurement methods" and "knowledge of different ... assessment techniques" within its professional studies component (NCATE, 1986, p. 29). Additionally, the American Association of Colleges of Teacher Education's (1988) outline of the knowledge base for the beginning teacher includes how to evaluate learning outcomes within a chapter on knowledge of instruction.

TOPICS:
- development of behavioral objectives
- taxonomic structure of the cognitive domain
- taxonomic structure of the affective domain
- selection of assessment methods
- test specification tables
- test types and their advantages and disadvantages
- item writing for all levels of thinking skills
- criterion-referenced scoring rules and recommendations
- norm-referenced scoring rules and recommendations
- item banking
- test assembly, duplication, and administration
- classification of standardized tests
- examples of standardized tests
- locating and evaluating standardized tests
- development and use of performance assessments
- testing special populations
- information needs assessment
- preparing students for testing (e.g., coaching, dealing with test anxiety and test wiseness, use of sample tests)
- observation of individual students
- observation of group interactions
- recording and using observational data
- paper and pencil questionnaires
- personal and group interviews
- using opinions of others
- using student records

CONTENT: Interpretation of Assessments

SKILLS: Interpret scoring techniques and score reporting formats; communicate score interpretations to others effectively

RATIONALE: All tests should be both reliable and valid. However, since no test is technically perfect, both random and systematic errors of assessment are always present. Errors of interpretation are also possible, such as invalid scoring and score referencing (American Psychological Association, 1985). Therefore, the strengths and weaknesses of test results from a measurement perspective should be a part of the interpretation process (American Personnel and Guidance Association, 1978), both on the part of the teacher for himself or herself, and in

tests, a teacher should be able to support validity and reliability as well as justify the decision rules by which the scores are used (American Psychological Association, 1985); a teacher using less formal assessment formats should also be equipped to evaluate and improve their functioning since these results, too, are used in educational decision-making.

TOPICS: reliability and validity evaluation
conditions which affect reliability and validity
component (e.g., item) analysis
interpretability of results
efficiency of assessment forms (e.g., paper and pencil assessments, performance assessments, and oral questions)
reliability of sums and differences

CONTENT: Feedback and Grading

SKILLS: Demonstrate and apply techniques for feedback to students to improve their skills and to evaluate their progress; combine information into forms appropriate for grading

RATIONALE: Common educational uses of assessment include providing performance evaluations to students (and others) in various forms, such as written and verbal comments, and grades. These become important determiners of decisions about students by many individuals, including the students, themselves. Because of the significance of these evaluations, they should be developed validly and used effectively. Thus, a teacher needs to be aware of the choices available for feedback and for grading, and to be able to apply them appropriately (Stiggins, Conklin, Bridgeford, Green, and Brody, 1987).

TOPICS: matching feedback with the purpose of the assessment
written comments
communication of test scores
marking systems
bases for grading
combining information in grading

CONTENT: Ethics of Assessment

SKILLS: Evaluate the positive and negative effects of testing on individuals and groups; apply guidelines which promote equitable testing practices

RATIONALE: Whenever assessments are used, both useful and harmful outcomes are possible. Testing should be done in an environment which supports maximum potential performance and minimizes undesirable outcomes, and the results should be used in ways

communicating the results to others. Knowledge of appropriate scoring techniques and understanding of score reporting and referencing formats are prerequisite to valid use and interpretation.

TOPICS: error in assessment and confidence bands
limitations of specific measurement methods
bias in assessment
standardized score reporting systems (transformations and profiles)
communication of results
using assessment to group students, guide teaching, and monitor progress

CONTENT: Description of Assessment Results

SKILLS: Use techniques for data summarization and display to draw conclusions

RATIONALE: Drawing conclusions from test results is best done using formats and indices that clarify relevant features of data appropriately, requiring an understanding of both the techniques, themselves, and the bases upon which they should be chosen. The American Association of Colleges of Teacher Education's (1988) outline of the knowledge base for the beginning teacher reflects this by including statistics and decision making related to measurement and evaluation results, along with interpretation of research and evaluation of instructional effectiveness within a chapter on evaluation.

TOPICS: univariate frequency distributions and graphical techniques (e,g., frequency polygons, histograms, bar graphs, pie diagrams)
measures of central tendency (mean, median, mode) and variability (variance, standard deviation)
percentiles and percentile ranks
referencing normal distributions
bivariate graphical techniques (scatter diagrams, contingency tables, overlapping frequency polygons; expectancy tables)
correlation and regression

CONTENT: Evaluation and Improvement of Assessments

SKILLS: Explain and apply methodology for assessing the quality of measurements and techniques for improving them

RATIONALE: Assessments differ in quality. Given that measurement is done (Newman and Stallings, 1982; Stiggins, 1987), it should be done well. The methodology of evaluation of assessment tools can help to show how well a test is working and to provide information useful in its improvement. When using standardized

that protect the rights and interests of the students (American Psychological Association, 1985; American Personnel and Guidance Association, 1978; Joint Committee on Testing Practices, 1988). An understanding of the principles surrounding ethical use of assessment is necessary in order to apply fair testing practices.

TOPICS: role of assessment in the academic and interpersonal environment of the classroom
effects of assessment on the perceptions, behavior, and motivation of students
published statements on responsibilities of test producers and users
legislative and judicial positions on testing

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